NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD AND SPECIFICATIONS

CONTOUR BUFFER STRIPS

(Acre)
CODE 332

DEFINITION

Narrow strips of permanent, herbaceous vegetative cover established across the slope and alternated down the slope with parallel, wider cropped strips.

PURPOSES

This practice may be applied as part of a conservation management system to support one or more of the following:

- Reduce sheet and rill erosion.
- Reduce transport of sediment and other water-borne contaminants downslope, on-site or off-site.
- Enhance wildlife habitat.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to cropland. It is most suited to uniform slopes ranging from 4 to 8 percent with slope lengths less than the Critical Slope Length (refer to the Field Office Technical Guide, Section I-(iv)-A-17, pages 26 through 48). This practice is also most suitable in regions where rainfall intensities are low to moderate.

This practice is not suited to fields with extremely long slopes whose length exceeds the critical slope length for contouring by more than a ratio of 1.5 to 1, unless the field slope length is shortened by the installation of conservation practices such as terraces.

This practice is more difficult to establish on undulating to rolling topography because of the difficulty in maintaining parallel strip boundaries across the hill slope or staying within row grade limits.

The narrow strips of permanent vegetative cover are not a part of the normal crop rotation.

This standard does not apply to situations where the width of the buffer strips will be equal to or exceed the width of the adjoining crop strips.

CRITERIA

General Criteria Applicable to All Purposes

a. Row Grade, Strip Boundaries, and Baselines

The grade of the cropped strip shall be aligned as closely as possible to the contour to achieve the greatest erosion reduction possible. The maximum grade of rows within the crop strips shall not exceed one-half of the up and down hill field slope or 2 percent, whichever is less.

For crops sensitive to standing water for periods less than 48 hours, design a positive row grade of not less than 0.5 percent from the nose of a hill or ridge toward a stable outlet. Up to 3 percent row grade is allowed for a maximum of 150 feet as crop rows approach a stable outlet.

The grade along the up slope side of the vegetated buffer shall be the same as for the cropped strip directly above it.

When the grade of any crop strip reaches the maximum allowable design grade, a new baseline shall be established up or down slope from the last

buffer strip and used for the layout of the next crop strip.

b. Arrangement of Strips

Cropped strips shall be alternated with buffer strips down the hill slope. Normally, a crop strip will occupy the area at the top of the hill.

When used in combination with terraces, the layout of buffer strips shall be coordinated with the grade and spacing of the terraces so that strip boundaries will parallel terraces whenever possible. The buffer strip shall occupy the terrace or diversion berm, a channel leading to a water and sediment control basin, or lie immediately up slope of the terrace or diversion channel.

c. Stable Outlets

Surface flow from the contoured crop rows must go to a stable outlet. Stable outlets include grassed waterways, underground outlets for terraces or diversions, water and sediment control basins, field borders, headlands or end rows, or similarly stabilized areas.

Additional Criteria to Reduce Sheet and Rill Erosion

a. Width of Strips

The buffer strips shall be of equal width except when a varying width buffer strip is needed to keep either an adjacent cropped strip of uniform width or to maintain the strip boundary grades within required criteria. Width of buffer strips at their narrowest point shall be no less than 15 feet for grasses or grass and legume mixtures and no more than 30 feet when legumes are seeded without a grass component.

Cropped strips shall be of uniform width between buffer strips and not exceed the lesser of:
1) 50 percent of the slope length (L) used in the erosion calculations, or
2) 50 percent of the critical slope length for contour buffer strips. (This critical slope length is calculated by multiplying 1.5 times the critical slope length for contour farming using RUSLE technology.)

Cropped strip width shall be designed to account for some multiple of the full width of all equipment used on the field.

b. Vegetation

Vegetation grown on buffer strips designed to reduce sheet and rill erosion shall be established to permanent vegetative cover consisting of grasses, legumes, or grass-legume mixtures. Establish cover according to the PASTURE AND HAYLAND PLANTING (512) practice standard.

Species shall be adapted to the site and tolerant of the anticipated depth of sediment deposition. The use of vegetation with upright, stiff stems is desired. No plants listed on the state or county noxious weed list will be established in a buffer strip cropping system.

The buffer strips shall have a vegetative Cover-Management Condition of 1 (established meadow – very dense cover) or 2 (first year meadow or grass-legume hay just before cutting) that provides protective cover and induces sediment deposition during periods when erosion is expected to occur on the cropped strips. Cropped strips will normally be expected to have a Cover-Management Condition within the range from 3 through 7. (Cover-Management Conditions are described in the Field Office Technical Guide, Section I-(iv)-A-17, pages 12 and 13.)

The stem density for grass species shall be greater than 50 and for legumes greater than 30 stems per square foot.

c. Level of Erosion Control

The level of erosion control achieved by the buffer strip cropping practice shall meet or exceed the soil erosion level specified by the conservation plan objectives. Soil loss shall be determined using the approved erosion prediction technology accounting for the impact of other conservation practices in the conservation system.

d. Headlands or End Rows

Keep headlands or end rows in permanent sod if their designed grade would be steeper than the designed grade of the crop strip.

Additional Criteria to Reduce Transport of Sediment and Other Water-borne Contaminants Downslope

a. Width of Strips

On fields having slopes exceeding 3 percent, the buffer strip width shall be based on the minimum criteria listed above to reduce sheet and rill erosion. On slopes of 3 percent or less, the width of the buffer strip shall be 15 feet or wider.

The maximum width of cropped strips between buffer strips shall be one-half of the field slope length not to exceed 150 feet. Cropped strip width shall be designed to account for some multiple of full width of all equipment used on the field.

b. Vegetation

Buffer strips designed to reduce the transport of sediment and other water-borne contaminants shall be established to permanent sod forming vegetation with stiff, upright stems only. Establish vegetation according to the PASTURE AND HAYLAND PLANTING (512) practice standard.

No plants listed on the state and county noxious weed list will be established in a buffer strip cropping system.

c. Arrangement of Strips

Buffer strips and crop strips will be alternated down the hill slope. A buffer strip will be established at the bottom of the slope. The width of this buffer strip will be two times the width of the other buffer strips in the system.

d. Headlands and End Rows

Headlands or end rows shall be vegetated and have a minimum width of 15 feet between the end of the tilled strip and the field edge.

Additional Criteria to Enhance Wildlife Habitat

To enhance wildlife habitat, a native warm-season grass species mixture rated good to excellent for wildlife will be planted where adapted. Establish vegetation according to the CONSERVATION COVER (327) practice standard to consider erosion control and wildlife benefits.

Mow only after the desired species of ground nesting birds have hatched. Allow time for regrowth before the growing season ends.

To enhance wildlife cover, the width of buffer strips will be increased to 30 feet or wider as determined based on the requirements for nesting and escape cover for the target wildlife species.

The maximum width between buffer strips shall not exceed 300 feet.

CONSIDERATIONS

Protect areas of existing or potential concentrated flow erosion by any one or more suitable conservation practices such as grassed waterways, water and sediment control basins, or diversion terraces.

When the slope length exceeds the critical slope length for the Cover-Management Condition that best characterizes the field to be contour buffer stripped, establish structures such as terraces to reduce the slope length below critical if the soil loss objective has not been obtained.

On fields where row crops are a part of the rotation, consider establishing field borders on headlands and end rows that are steeper than the designed grade of rows in the cropped strip. Where contour row curvature becomes too sharp to keep equipment aligned with rows during field operations, consider increasing the buffer strip width to avoid sharp ridge points. These strips should be wide enough to allow equipment to be lifted and turned to meet the same rows across the turn strip.

Prior to design and layout, consider removing any obstructions or making changes in field boundaries

or shape, where feasible, to improve the effectiveness of the practice and the ease of performing farming operations.

Prior to layout, inspect the field's position on the landscape to find key points for commencing layout or getting the width of one set of strips (one cropped and one buffer) to bypass an obstruction or ridge saddle. Considering grade limits, whenever possible, run strip boundaries parallel with fence lines or other barriers. Account for uncropped access road widths that may traverse the field by adjusting strip boundaries on either side accordingly.

Some non-noxious weed growth may be allowed in the strips to provide an insect source for young birds. Also, consider adding native forbs to the seeding mixture.

The standing residual cover provides early and late season nesting and escape cover for many species of wildlife displaced from other disturbed areas in the field.

PLANS AND SPECIFICATIONS

Site specifications for establishment and maintenance of this practice shall be prepared for each field or treatment unit according to the Criteria, Considerations, and Operation and Maintenance described in this standard.

Site specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

OPERATION AND MAINTENANCE

Conduct all farming operations parallel to the strip boundaries except on headlands or end rows with gradients less than the criteria set forth in this standard.

Time mowing of buffer strips to maintain appropriate vegetative density and height for optimum trapping of sediment from the up slope cropped strip during critical erosion periods. If wildlife enhancement is the primary objective, delay mowing until after the desired species of ground nesting birds has hatched.

Fertilize buffer strips as needed to maintain desired stand density.

Mow sod turn strips and grassed waterways at least annually.

Spot seed or totally renovate buffer strip systems damaged by herbicide application after residual action of the herbicide allows seedling establishment.

Redistribute sediment accumulations along the up slope edge of the buffer-crop strip when needed to maintain uniform sheet flow along the strip boundary. If sediment accumulates just below the up slope edge of the buffer strip to a depth of 6 inches or more or the stem density falls below the minimum, relocate the buffer-crop strip interface.

Cultivated strips and buffer strips shall be rotated so that a mature stand of protective cover is achieved in a newly established buffer strip immediately above or below the old buffer strip before removing the old buffer to plant an erosion-prone crop. Reposition buffer strips in an established pattern to maintain their relative position on the hill slope.

Renovate vegetated headlands or end row areas as needed to keep ground cover above 65 percent.